AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remains under examination in the application are presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough; and 2. added matter is shown by underlining.

1. (Previously Presented) A cathode composition comprising vanadium oxide particles having an average diameter from about 5 nm to about 1000 nm and a binder, wherein the collection of vanadium oxide particles have a distribution in sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

2. (Cancelled)

3. (Cancelled)

4. (Previously Presented) The cathode composition of claim 1 wherein the binder comprises polyvinlyidene fluoride, polytheylene oxide, polyethylene, polyproplylene, polytetrafluoroethylene, polyacrylates or mixtures or copolymers thereof.

5. (Previously Presented) The cathode composition of claim 1 further comprising supplementary electrically conductive particles.

6. (Previously Presented) The cathode composition of claim 5 wherein the supplementary electrically conductive particles comprise carbon.

7. (Previously Presented) The cathode composition of claim 1 wherein the cathode comprises from about 60 percent by weight to about 98 percent by weight vanadium oxide particles.

8. (Previously Presented) A battery comprising an anode, a cathode comprising vanadium oxide particles having an average diameter from about 5 nm to about 1000 nm and a binder, and a separator element disposed between the anode and the cathode, wherein the collection of vanadium oxide particles have a distribution in sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

9. (Previously Presented) The battery of claim 8 wherein the anode comprises lithium metal.

10. (Previously Presented) The battery of claim 8 wherein the anode comprises a composition that intercalates lithium.

11. (Previously Presented) The battery of claim 10 wherein the intercalation compound within the anode comprises carbon.

12. (Canceled)

13. (Previously Presented) The battery of claim 8 wherein the separator element comprises a polymer electrolyte.

14. (Previously Presented) The battery of claim 8 wherein the separator element comprises a porous polymeric material.

15. (Currently amended) A battery comprising an anode, an electrolyte, a cathode and a separator element disposed between the anode and the cathode, the electrolyte comprising lithium ions and the cathode comprising nanoparticles of electroactive material that intercalate lithium ions and a binder, wherein the electroactive material comprises vanadium oxide and wherein the electroactive material in the cathode exhibits an energy density greater than about 900 Wh/kg during discharge of the battery when discharged from 4 volts to 1.8 volts at 25°C.

16. (Previously Presented) The battery of claim 15 wherein the battery is a secondary battery.

17. (Previously Presented) The battery of claim 15 wherein the electroactive material in the cathode exhibits an energy density from about 950 Wh/kg to about 1200 Wh/kg.

18. (Previously Presented) The battery of claim 15 wherein the electroactive nanoparticles comprise vanadium oxide.

19. (Previously Presented) The battery of claim 15 wherein the electroactive material in the anode comprises a composition that intercalates lithium.

20. (Previously Presented) A method of forming a battery, the method comprising incorporating a collection of vanadium oxide particles having an average diameter from about 5 nm to about 1000 nm into a cathode structure, wherein the collection of vanadium oxide particles have a distribution in sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than about 160 percent of the average diameter.

21. (Previously Presented) The method of claim 20 wherein the incorporation of the collection of vanadium oxide particles into the cathode structure comprises combining a binder with the collection of vanadium oxide particles.

22. (Previously Presented) The method of claim 21 wherein the binder comprises a polymer.

23. (Previously Presented) The method of claim 20 wherein the incorporation of the collection of vanadium oxide particles into the cathode structure comprises combining additional electroactive particles with the collection of vanadium oxide particles.

24. (Previously Presented) The method of claim 20 wherein the incorporation of the collection of vanadium oxide particles into the cathode structure comprises combining electrically conductive particles with the collection of vanadium oxide particles.

25. (Previously Presented) The method of claim 24 wherein the electrically conductive particles comprise conductive carbon particles or metal particles.

26. (Previously Presented) The method of claim 20 wherein the vanadium oxide particles have an average diameter from about 5 nm to about 50 nm.

27. (Previously Presented) The method of claim 20 wherein the binder comprises polyvinylidene fluoride, polyethylene oxide, polyethylene, polypropylene, polytetrafluoroethylene, polyacrylates or mixtures or copolymers thereof.

28. (Previously Presented) The method of claim 20 wherein the resulting cathode structure comprises from about 60 weight percent to about 98 weight percent vanadium oxide particles.

29. (Cancelled)

30. (Previously Presented) The cathode composition of claim 1 wherein the collection of vanadium oxide particles have an average particle size of no more than about 500 nm.

31. (Previously Presented) The cathode composition of claim 1 wherein the collection of vanadium oxide particles have an average particle size of no more than about 400 nm.

32. (Previously Presented) The cathode composition of claim 1 wherein the collection of vanadium oxide particles have an average particle size of no more than about 300 nm.

33. (Previously Presented) The cathode composition of claim 1 wherein the collection of vanadium oxide particles have an average particle size of no more than about 200 nm.

34. (Previously Presented) The battery of claim 8 wherein the collection of vanadium oxide particles have an average particle size of no more than about 500 nm.

35. (Previously Presented) The battery of claim 8 wherein the collection of vanadium oxide particles have an average particle size of no more than about 400 nm.

36. (Previously Presented) The battery of claim 8 wherein the collection of vanadium oxide particles have an average particle size of no more than about 300 nm.

37. (Previously Presented) The battery of claim 8 wherein the collection of vanadium oxide particles have an average particle size of no more than about 200 nm.

38. (Previously Presented) The battery of claim 15 wherein the nanoparticles comprise vanadium oxide particles and wherein the vanadium oxide particles have an average particle size of no more than about 500 nm.

39. (Previously Presented) The battery of claim 15 wherein the nanoparticles comprise vanadium oxide particles and wherein the vanadium oxide particles have an average particle size of no more than about 400 nm.

40. (Previously Presented) The battery of claim 15 wherein the nanoparticles comprise vanadium oxide particles and wherein the vanadium oxide particles have an average particle size of no more than about 300 nm.

41. (Previously Presented) The battery of claim 15 wherein the nanoparticles comprise vanadium oxide particles and wherein the vanadium oxide particles have an average particle size of no more than about 200 nm.

42. (Previously Presented) The battery of claim 15 wherein the nanoparticles comprise vanadium oxide particles and wherein the vanadium oxide particles have a distribution in sizes such that at least about 95 percent of the particles have a diameter greater than about 40 percent of the average diameter and less than 160 percent of the average diameter.

43. (Previously Presented) The method of claim 20 wherein the collection of vanadium oxide particles have an average particle size of no more than about 500 nm.

44. (Previously Presented) The method of claim 20 wherein the collection of vanadium oxide particles have an average particle size of no more than about 400 nm.

45. (Previously Presented) The method of claim 20 wherein the collection of vanadium oxide particles have an average particle size of no more than about 300 nm.

46. (Previously Presented) The method of claim 20 wherein the collection of vanadium oxide particles have an average particle size of no more than about 200 nm.

47. (Previously Presented) A cathode composition comprising vanadium oxide particles having an average diameter from about 5 nm to about 500 nm and a binder.

48. (Previously Presented) The cathode composition of claim 47 wherein the collection of vanadium oxide particles has an average particle size of no more than about 400 nm.

49. (Previously Presented) The cathode composition of claim 47 wherein the collection of vanadium oxide particles has an average particle size of no more than about 300 nm.

50. (Previously Presented) The cathode composition of claim 47 wherein the collection of vanadium oxide particles has an average particle size of no more than about 200 nm.

51. (Previously Presented) The cathode composition of claim 47 further comprising supplementary electrically conductive particles.

52. (Previously Presented) The cathode composition of claim 47 wherein the binder comprises polyvinylidene fluoride, polyethylene oxide, polyethylene, polypropylene, polytetrafluoroethylene, polyacrylates or mixtures or copolymers thereof.